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Foot Step Power Generation System

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Abstract: The deployment of different clean energy systems is a crucial strategy to achieve environment sustainability. Most of the people are spending most of their time in walking. Walking is also known as ambulation, i.e., a fundamental and common locomotion for human in daily life. The contacts between human feet and ground surface is created during the walking. The forces experienced by human feet upon landing on the ground can generate a renewable energy known as kinetic energy. This energy can be converted into electricity through a footstep power generator.

I. INTRODUCTION

Man has needed and used energy at an increasing rate for his sustenance and well being ever since he came on the earth a few million years ago. Primitive man required energy primarily in the form of food. He derived this by eating plants or animals, which he hunted. Subsequently he discovered fire and his energy needs increased as he started to make use of wood and other bio mass to supply the energy needs for cooking as well as for keeping himself warm. With the passage of time, man started to cultivate land for agriculture. He added a new dimension to the use of energy by domesticating and training animals to work for him. With further demand for energy, man began to use the wind for sailing ships and for driving windmills, and the force of falling water to turn water for sailing ships and for driving windmills, and the force of falling water to turn water wheels. Till this time, it would not be wrong to say that the sun was supplying all the energy needs of man either directly or indirectly and that man was using only renewable sources of energy.

II. FOOT STEP ARRANGEMENT

This is made up of mild steel. The complete set up is fixed in this model FOOT STEP. The two L-shapes frame is fixed in the above two ends of the track. Below this l-shapes window, the actual power generation arrangement is constructed. This L-shapes window pushes the rack when the time of train wheel moving on these arrangement.

III. BLOCK DIAGRAM

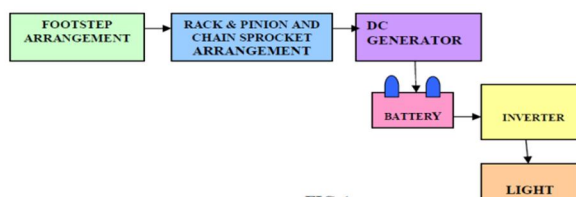


FIG-1

A. COMPONENTS & DESCRIPTIONS:

B. COMPONENTS:

C. SHAFT

D. BEARINGS

E. RACK & PINION

F. SPROCKETS

G. CHAIN DRIVE

H. GEAR ARRANGEMENT

I. SPRING

J. BATTERY

K. FLYWHEEL

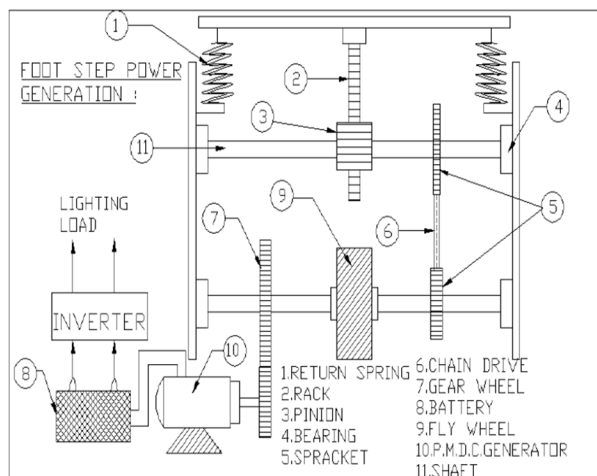
L. P.M.D.C. GENERATOR

M. HEX NUT

N. BOLT

O. WASHER

IV. ASSEMBLY DIAGRAM



V. WORKING PRINCIPLE

The complete diagram of the power generation using FOOT STEP is given below. L-shapes window is inclined in certain small angle which is used to generate the power. The pushing power is converted into electrical energy by proper driving arrangement. The rack & pinion, spring arrangement is fixed at the FOOT STEP which is mounded bellow the L-shapes window. The spring is used to return the inclined L-shapes window in same position by releasing the load. The pinion shaft is connected to the supporter by end bearings as shown in fig. The larger sprocket also coupled with the pinion shaft, so that it is running the same speed of pinion. The larger sprocket is coupled to the small cycle sprocket with the help of chain (cycle).

This larger sprocket is used to transfer the rotation force to the smaller sprocket. The smaller sprocket is running same direction for the forward and reverse direction of rotational movement of the larger sprocket. This action looks like a cycle pedaling action.

The fly wheel and gear wheel is also coupled to the smaller sprocket shaft. The flywheel is used to increase the rpm of the smaller sprocket shaft. The gear wheel is coupled to the generator shaft with the help of another gear wheel. The generator is used here, is permanent magnet D.C generator. The generated voltage is 12Volt D.C. This D.C voltage is stored to the Lead-acid 12 Volt battery. The battery is connected to the inverter. This inverter is used to convert the 12 Volt D.C to the 230 Volt A.C. This working principle is already explained the above chapter. This 230 Volt A.C voltage is used to activate the light, fan and etc.

By increasing the capacity of battery and inverter circuit, the power rating is increased. This arrangement is fitted in FOOT STEPS; the complete arrangement is kept inside the floor level except the pushing arrangement.

VI. ADVANTAGES

- A. Reliable, Economical, Eco-Friendly.
- B. Less consumption of Non- renewable energies.
- C. Excellent linearity over their dynamic range
- D. Wide frequency range, high frequencies can be measured
- E. Compact yet highly sensitive
- F. No moving parts - long service life
- G. Self-generating - no external power required
- H. Great variety of models available for nearly any purpose
- I. Integration of the output signal provides velocity and displacement.

VII. APPLICATIONS

- A. Foot step generated power can be used for agricultural, home applications, street-lighting.
- B. Foot step power generation can be used in emergency power failure situations.
- C. Metros, Rural Applications etc.,

VIII. CONCLUSIONS

In concluding the words of our project, since the power generation using foot step get its energy requirements from the Non-renewable source of energy. There is no need of power from the mains and there is less pollution in this source of energy. It is very useful to the places all roads and as well as all kind of foot step which is used to generate the non conventional energy like electricity.

It is able to extend this project by using same arrangement and construct in the footsteps/speed breaker so that increase the power production rate by fixing school and colleges, highways etc.

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